(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 089 587 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.04.2001 Bulletin 2001/14

(51) Int Cl.7: H04Q 7/38, H04Q 7/22,
H04L 12/56

(21) Application number: 00308645.1

(22) Date of filing: 02.10.2000

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 02.10.1999 KR 9942478

(71) Applicant: LG ELECTRONICS INC.
Seoul (KR)

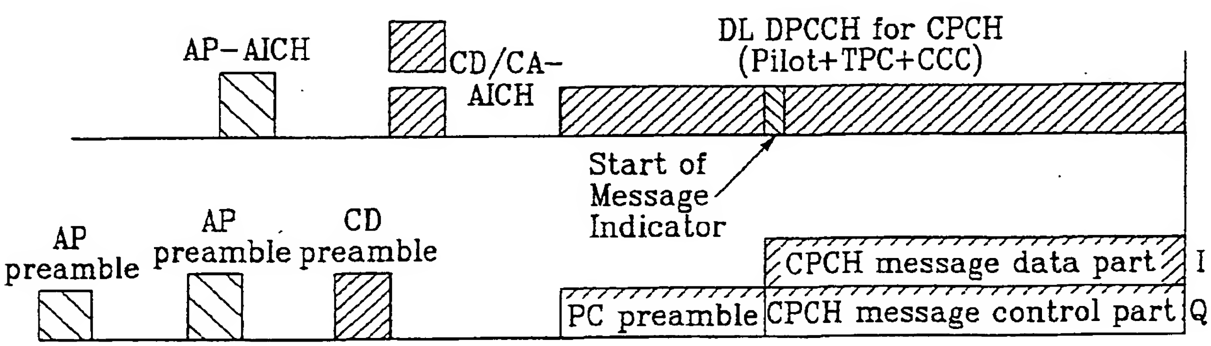
(72) Inventor: Lee, Young Dae
Hanam-shi, Kyonggi-do (KR)

(74) Representative:
Baverstock, Michael George Douglas et al
BOULT WADE TENNANT,
Verulam Gardens
70 Gray's Inn Road
London WC1X 8BT (GB)

(54) Method of allocating common packet channel in next generation communication system

(57) Method of allocating a common packet which can allocate a correct common packet channel (CPCH), the method including transporting, at a base station (BS), a common packet channel control command (CCC) to a user equipment (UE) through a dedicated physical channel (DPCH) when a power control preamble is transported from the user equipment; and transporting, at the user equipment, a common packet channel message to the base station through the common packet channel when the common packet channel control command is received within a predetermined time, thereby providing stable telecommunication services.

FIG.4



EP 1 089 587 A2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a next generation mobile communication system, and more particularly to a method of allocating a common packet channel (CPCH) in a next generation mobile communication system which can allocate a correct common packet channel (CPCH).

2. Discussion of the Related Art

[0002] Recently, ARIB and TTC in Japan, ETSI in Europe, T1 in U.S.A., and TTA in Korea have organized a Third Generation Partnership Project (3GPP) to establish a technical standard for the mobile communication system of the next generation.

[0003] In the searches of the 3GPP, the searches of UTRAN provide a definition and explanation of a transport channel and a physical channel.

[0004] Referring to the pertinent searches, a common packet channel (CPCH), which is one of the transport channels, is allocated between a base station (BS) and a user equipment (UE) to transport relatively long data from the UE to the BS through an Up-Link (UL). The Up-Link common packet channel. (CPCH) is related to a dedicated channel (DCH), which is a channel for performing a close loop power control, while the DCH is mapped by a dedicated physical control channel (DPCCH). Such a CPCH is allocated to diverse UE by means of a random access manner.

[0005] The efficient allocation of the CPCH is currently recognized as being critical to avoiding a collision of the allocated channel when the CPCH is allocated in 3GPP.

[0006] Fig. 1 illustrates a transporting manner of the common packet channel (CPCH) in the related art, and Fig. 2 illustrates a structure of a Down Link dedicated physical control channel (DL DPCCH) for the common packet channel (CPCH) in the related art.

[0007] The CPCH manner includes a CPCH Status Indicator Channel, which transports information on the availability and maximum transport rate of the CPCH provided by a base station, a Physical Common Packet Channel Access Preamble (PCPCH AP) section for requesting a use of a specific physical common packet channel (PCPCH), an AP-Acquisition Indicator Channel (AICH) for transporting a response for the AP, a PCPCH Collision Detection Preamble (CD-P) section for a collision detection and a resolution, a collision Detection/Channel Assignment Indicator Channel for a response and the channel allocation to the CD-P, a PCPCH Power Control Preamble (PC-P) section having a length of 0 or 8 slots for determining the transport power level before transporting the data, a DL Dedicated Physical Control Channel (DPCCH) for providing an inner loop power control, a PCPCH message section for transporting a user packet data as shown in Fig. 1. Here, the PCPCH message section is divided into a PCPCH message data section and a PCPCH message control section.

[0008] Meanwhile, the CPCH in 3GPP operates in two modes. One is a UE channel selection method, which selects the CPCH, and the other is a versatile channel assignment method, which informs the UE after a Node B corresponding to the base station allocates the CPCH.

[0009] The CPCH Status Indicator Channel (CSICH) in the UCSM periodically transports information on availability of each CPCH.

[0010] The CSICH in VCAM periodically transports the information on the availability and the maximum transport rate of each CPCH.

[0011] The Access Preamble (AP), the Collision Detection Preamble (CD-P), and AP-AICH transport one of the 16 signature sets having 16 lengths. The AP signature in the UCSM indicates a specific channel, i.e., a scrambling code of the specific channel.

[0012] AP signature in VCAM indicates a data transport rate desired by the UE. In the VCAM, specific channels are indicated by means of an AP signature, a signature of CD/CA-ICH, and a code.

[0013] Of the 16 signature sets having 16 lengths that are different from one another, 8 pieces are used for a response to the CD-P, while the other 8 pieces are used for a channel allocation.

[0014] CD/CA-ICH transports one of 8 signatures for the CD-P response in the UCSM method, while simultaneously transporting one of the 8 signatures for the CD-P response and one of the 8 signatures for the channel allocation in the VCAM. Accordingly, the two signatures are transported at the same time for different purposes according to the VCAM method.

[0015] Fig. 2 shows a structure of the DL Dedicated Physical Channel (DPCH) in the related art, which comprises a Dedicated Physical Control Channel (DPCCH) and a Dedicated Physical Data Channel (DPDCH). The DL DPCCH includes a Pilot, TPC, and TFCI, while the DL DPDCH includes a data channel.

[0016] Fig. 3 is a timing sequence diagram to explain a process of transporting the normal common packet channel in the related art.

[0017] Fig. 3 illustrates the process of transporting the common packet channel for a transport block set between a serving user radio network controller and a radio link control (SRNC-RLC) in a user equipment radio link control (UE RLC).

[0018] First, the UE performs the CPCH configuration for transporting the CPCH through a Radio Resource Control (RRC) procedure such as a radio bearer setup or a transport channel reconfiguration.

[0019] That is, the Medium Access Control (MAC) layer 2 of the UE receiving a request for transport of the data from the Radio Link Control (RLC) layer 1 of the

UE through MAC-D-Data-REQ requests to layer 3 of the UE a status report of the CPCH through PHY-CPCH-Status-REQ. The status report is broadcasted through the CSICH using a channelization code such as an AP-AICH.

[0020] The L1 layer 3 of the UE receives the status report from the CSICH and transfers the same to the MAC layer 2 of the UE through PHY-CPCH-Status-CNF.

[0021] The MAC layer 2 of the UE selects a transport format for requesting CPCH access from the CSICH, and requests L1 layer 3 of the UE an access through PHY-Access-REQ after delay of a specific length by performing a persistency check in accordance with the persistency value. At this stage, the L1 layer 3 of the UE forwards the AP with the first power P1. Next, the L1 layer 3 of the UE forwards the AP once again with the second power P2, which is higher than the first power P1 when a response for the AP is not received after elapse of a predetermined time.

[0022] An L1 layer 4 of the base station (Node B), which has received the AP from the L1 layer 3 of the UE, informs the received information to the RRC 5 of the base station (Node B), selects and transports the specific signature to the L1 layer 3 of the UE through AP-AICH. At this stage the ACK message is forwarded according to the signature of the AP-AICH.

[0023] The L1 layer 3 of the UE, which has received the ACK through AP-AICH, transports the CD-P to the L1 layer 4 of the base station (Node-B). The base station (Node-B), which has received the CD-P selects the specific signature and transports the CD/CA-ICH.

[0024] The CD/CA-ICH in the UCSM only reply to the CD-P, while the CD/CA-ICH in the VCAM performs a reply and a channel allocation forthe CD-P. At this time, the information on the channel allocation in the VCAM defines a scrambling code for the PC-P and the CPCH message section (the CPCH message data section, the CPCH message control section) in the L1 layer 3 of the UE.

[0025] The MAC layer 2 of the UE, which has received the PHY-Access-CNF from the L1 layer of the UE, selects the transport format of the CPCH and requests the data transport through PHY-Data-REQ after making a transport block set.

[0026] The L1 layer 3 of the UE, which has received PHY-Data-REQ, transports the message after establishing the transport power control preamble (PC-P) of 0 or 8 slot length. The data transport through the CPCH is continuously performed until all the data are transported, or to the end of the maximum frame length designated by the system.

[0027] The information on ACK or NAK of the RNC/RLC layer 8 is forwarded to the RLC layer 1 of the UE through the FACH.

[0028] Fig. 3 shows a process of transporting the CPCH for a transport block set, which is transported first from point A to point B, and a process of transporting the CPCH for each linked transport block set from point C to point D.

Summary of the Invention

[0029] To address the problems and disadvantages of the related art, it would be desirable to provide a method of allocating CPCH in a mobile communication system of next generation, by which the UE can transport data through correct utilization of the CPCH allocated by a base station.

[0030] Additional advantages, objects, and features of the invention will be set forth in part in the following description and will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objects and advantages of the invention may be realized and attained as particularly pointed out in the appended claims.

[0031] Accordingly, the present invention provides a method of allocating a CPCH in a mobile communication system of next generation, the method comprising the steps of: transporting at a base station (BS) a common packet channel control command (CCC) to a UE through a DPCH when a power control preamble is transported from the UE; and transporting at the UE a common packet channel message to the base station through the common packet channel when the common packet channel control command is received within a predetermined time.

Brief Description of the Drawing

[0032] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 illustrates a transport manner of a common packet channel (CPCH) in the related art;

Fig. 2 illustrates a structure of a Down Link dedicated physical control channel (DL DPCCH) for a common packet channel (CPCH) in the related art;

Fig. 3 is a timing sequence diagram to explain a process of transporting the normal common packet channel in the related art;

Fig. 4 is a diagram illustrating a transporting manner of CPCH embodying the invention;

Fig. 5 is a diagram illustrating a structure of the DL DPCCH for CPCH embodying the invention;

Fig. 6 is a diagram illustrating a first format of the DL DPCCH for CPCH embodying the invention;

Fig. 7 is a diagram illustrating the process of transporting the normal CPCH embodying the invention; and

Fig. 8 is a diagram illustrating a second format of the DL DPCCH for CPCH embodying the invention.

Detailed Description of the Invention

[0033] Fig. 4 is a diagram illustrating a transporting manner of CPCH embodying the present invention, and Fig. 5 is a diagram illustrating a structure of the DL DPCCH for CPCH embodying the present invention. Fig. 6 is a diagram illustrating a first format of the DL DPCCH for CPCH embodying the present invention.

[0034] The characteristic feature of the CPCH manner embodying the present invention distinguished from the conventional CPCH manner lies in transport of the start of message indicator through DL DPCH, as shown in Fig. 4. For that purpose, embodiments of the invention transport not only the information on pilot transport power control (TPC) but also the information on the CPCH control command (CCC) to the DL DPCH, as shown in Fig. 4. This was to resolve the problem of the related art lacking the same.

[0035] In other words, the DL DPCCH embodying the invention transports the information on control only, thereby not necessitating the DL DPDCH. To be specific, the DL DPCCH for CPCH embodying the invention comprises the information on pilot, TPC, transport format combination indicator (TFCI) and CCC. Here, the information on the TFCI is not expressed in 0 bit.

[0036] The CCC refers to the control command of CPCH in general or a control information of CPCH. Specifically, the CCC is either divided into a control information on a first layer L1 to transport the start of message indicator through DL DPCH and a control information having a phase higher than the first layer L1. In other words, the CCC may be a control information on the first layer L1 or a control information or a command of higher layers. Here, the length of the CCC transported through a CCC field may be a slot unit or a frame unit. For instance, the CCC may be a command or information of one slot length, of one frame or of several frames. Such CCCs are transported to the CCC field of the DL DPCCH for CPCH. Each CCC corresponds to a particular sequence. Accordingly, the command or information of each CCC is distinguished by different sequences. The system either pre-set the information on these sequences or transports the information on the sequences in the course of operating the system through control channels such as a broadcast channel (BCH) of the 3GPP or a forward access channel.

[0037] The Start of Message Indicator(SMI), which is one of the CCCs, is a control information of several frame.

[0038] For transport of the SMI, the base station transports a particular sequence for SMI to the CCC field of the DL DPCCH during the period of several frames. The base station system either pre-sets a sequence for the SMI or transports information on the sequence through a control channel such as the broadcast channel (BCH) or the forward access channel (FACH). All random sequences maybe for the SMI, e.g., [0000], [1111], [1010], [0101], [1100], [0011], etc., which are repeatedly transported to each slot. For instance, the [1010] sequence is repeatedly transported to each slot during the period of several frames immediately after the power control preamble (PC-P) of 0 or 8 slot length of the CPCH.

[0039] In case a specific sequence is used for the SMI, other sequences other than the specific sequence for SMI may be used for other CCCs. For instance, in case the [1010] sequence is used for the SMI, other sequences other than the [1010] sequence may be used for other CCCs.

[0040] The transport length of the SMI sequence is either pre-set or transported through a control channel such as the BCH or FACH of the 3GPP system.

[0041] If no CCC information or command is transported through the CCC field, nothing or a particular pattern is transported to the CCC field. Such a particular pattern may be used for estimation of a cannel or measurement of a power control.

[0042] To be specific, one of the patterns [0000], [1111], [1010], [0101], [1100], [0011], etc. not used in the ES is repeatedly transported to each slot. Preferably, when no CCC is transported to the CCC field, no pattern is transported to the CCC field. This means the power-off state of the CCC field. The CCC field becomes power-on only when a particular sequence is transported to transport the CCC.

[0043] Fig. 7 is a diagram illustrating the process of transporting the normal CPCH embodying the invention.

[0044] The L1 layer 3 of the UE, which has received the ACK through AP-AICH, transports the CD-P to the L1 layer 4 of the base station (Node-B). The base station (Node-B), which has received the CD-P selects the specific signature and transports the CD/CA-ICH.

[0045] The CD/CA-ICH in the UCSM only reply to the CD-P, while the CD/CA-ICH in the VCAM performs a reply and a channel allocation for the CD-P. At this time, the information on the channel allocation in the VCAM defines a scrambling code for the PC-P and the CPCH message section (the CPCH message data section, the CPCH message control section) in the L1 layer 3 of the UE.

[0046] The MAC layer 2 of the UE, which has received the PHY-Access-CNF from the L1 layer of the UE, selects the transport format of the CPCH and requests the data transport through PHY-Data-REQ after making a transport block set.

[0047] The L1 layer 3 of the UE, which has received PHY-Data-REQ, transports the message after establishing the transport power control preamble (PC-P) of 0 or 8 slot length. The data transport through the CPCH is continuously performed until all the data are transported, or to the end of the maximum frame length designated by the system.

[0048] While the first transport block is transported, the Node B L1 24 transports the start of message indicator to the UE L1 23. The UE L1 23 determines whether or not a correct CPCH has been opened depending on receipt of the start of message indicator. If the UE L1 23

fails to receive the start of message indicator during the pre-set (predetermined) period of time, the transport of CPCH message is immediately interrupted. Otherwise, the UE L1 23 continues transport of the message. To be specific, the UE receives the start of message indicator transported to the DL DPCCH for CPCH during the Nsmi frame after the PC preamble. If the UE L1 23 fails to receive the start of message indicator during the predetermined Nsmi frame, the UE L1 23 interrupts the message transport and notifies the UE MAC 22 of a failure message.

[0049] However, if the UE L1 23 receives the start of message indicator during the predetermined Nsmi frame, the UE L1 23 continues to transport the message. Here, the Nsmi frame value is transported to the UE L1 23 in advance through a control channel such as the BCH or FACH in the form of a system information.

[0050] Meanwhile, the information on acknowledgement (ACK) or non-acknowledgement (NAK) of the radio network controller or of the RLC layer 28 is transported to the UE RLC 21 through the FACH.

[0051] Fig. 7 shows from point A to point B the transporting process of the CPCH for the first-transported transport block set. Fig. 7 also shows from point C to point D a transporting process of the CPCH for transport of each consecutive transport block set.

[0052] Fig. 8 is a diagram illustrating a second format of the DL DPCCH for CPCH embodying the invention.

[0053] The second format of the DL DPCCH for CPCH is similar to the first format thereof as shown in Fig. 6. The only difference lies in that the TFCI of the DL DPCCH is 2 bits, and the CCC field is 2 bits.

[0054] In other words, Fig. 8 is a diagram illustrating a second format of the DL DPCCH for CPCH embodying the invention, and the TFCI field may be used for transporting information on the CPCH of the L1 and higher layers.

[0055] If the TFCI field is used for transporting the information on the CPCH control, the control information represented by an ordinary sequence such as the CCC field is transported. For instance, it is possible to transport the control information represented by a TFCI codeword by using a TFCI encoding and a TFCI mapping manner with respect to the physical channel. Here, even if the information transported to the TFCI field is a control information of the CPCH, the physical operating manner thereof is the same as the TFCI.

[0056] Otherwise the information transported to the TFCI field or to the CCC field may be constructed so as to be simultaneously or separately transported. If constructed to be separately transported, the sequences of 4 bits for the start of message indicator is transported in the same manner as for the CCC field of 4 bit by considering the TFCI of 2 bits and the CCC field of 2 bits as a field of 4 bits.

[0057] If constructed to be simultaneously transposed, the sequences for the SMI is constructed to be 2 bits per slot such as [11], [00], [10], [01], etc., thereby being transported to the CCC field of 2 bits. The operating manner of the CCC of 2 bits is the same as that of the CCC of 4 bits stated above except that the length of the sequence per slot is 2 bits.

[0058] As described above, the present invention has an effect of preventing an overlapped use of the CPCH currently on use by the UE, thereby providing stable telecommunication services.

[0059] The foregoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The description of the embodiments is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

Claims

1. A method of allocating a common packet channel (CPCH) in a next generation mobile communication system, the method comprising the steps of:

   transporting at a base station (BS), a common packet channel control command (CCC) to a user equipment (UE) through a dedicated physical channel (DPCH) when a power control preamble is transported from the user equipment; and

   transporting, at the user equipment, a common packet channel message to the base station through the common packet channel when the common packet channel control command is received within a predetermined time.

2. The method of claim 1, wherein the common packet channel control command (CCC) is a message start indicator information indicating a start of the common packet channel message between the base station and the user equipment.

3. The method of claim 2, wherein the message start indicator is transported to the user equipment when a transport power preamble for determining a transport level of the common packet channel message is transported from the user equipment to the base station.

4. The method of claim 3, wherein the message start indicator is transported through the dedicated physical channel during a plurality of frame just after the power control preamble(PC-P) for determining a transport power level is transported from the user equipment to the base station.

5. The method of claim 1, wherein the common packet channel control command comprises 1 slot, 1 frame or more than 2 frames.

6. The method of claim 2, wherein the message start indicator is sent through the dedicated physical control channel (DPCCH) after insulting a transport format combination indicator (TFCI) of the power control preamble.

7. The method of claim 1, wherein a field of transporting the common packet channel control command to the user equipment, is used for measurement performing a channel estimation or the power control during a time that the common packet channel control command is not transported to the user equipment.

8. The method of claim 2, wherein the user equipment transports the common packet channel message to the base station when the user equipment received the start of message indicator within the predetermined time.

9. The method of claim 2, wherein the user equipment interrupts the transport of the common packet channel message which is transported to the base station when the user equipment does not received the start of message indicator within the predetermined time.

10. The method of claim 1, wherein the dedicated physical control channel (DPCCH) for the common packet channel comprises a pilot field, a transport power control (TPC) field, a transport format combination identifier (TFCI), and a common packet channel control command.

11. The method of claim 10, wherein the pilot field is at least 4 bits, the transport power control (TPC) field is at least 2 bits, the common packet channel control command is at least 4 bits, and the transport format combination identifier (TFCI) is not used.

12. The method of claim 10, wherein the transport power control (TPC) field the transport format combination identifier (TFCI), and the common packet channel control command (CCC) are at least 2 bits, and the pilot field is at least 4 bits.

FIG.1

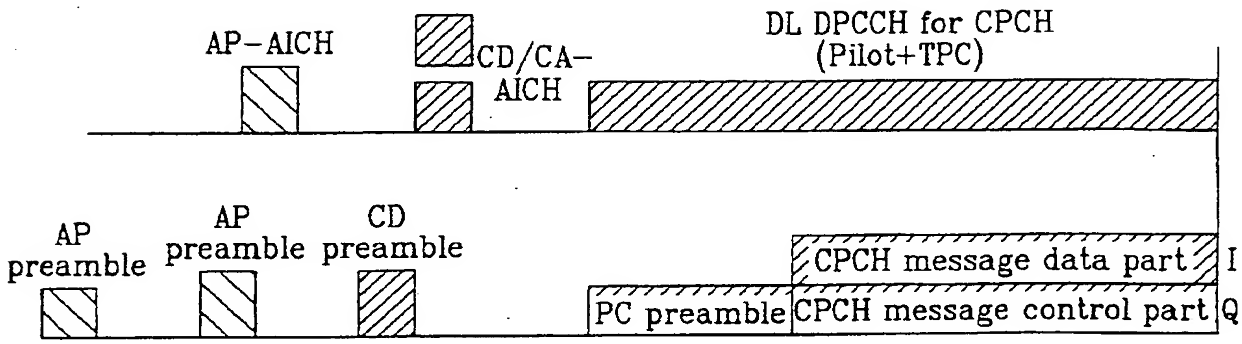

AP-AICH
CD/CA-AICH
DL DPCCH for CPCH (Pilot+TPC)
AP preamble
AP preamble
CD preamble
CPCH message data part
I
PC preamble
CPCH message control part
Q

FIG.2

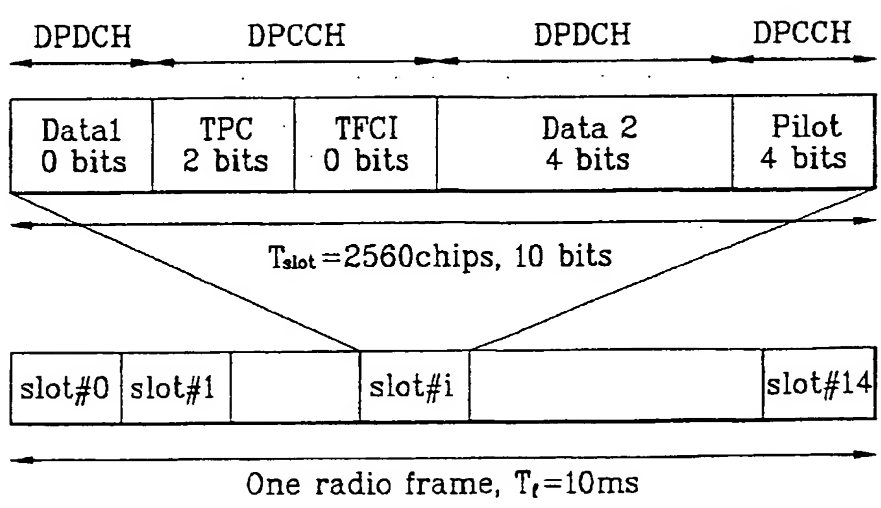

DPDCH
DPCCH
DPDCH
DPCCH
Data1 0 bits
TPC 2 bits
TFCI 0 bits
Data 2 4 bits
Pilot 4 bits
T_{slot}=2560chips, 10 bits
slot#0
slot#1
slot#i
slot#14
One radio frame, T_f=10ms

FIG.3

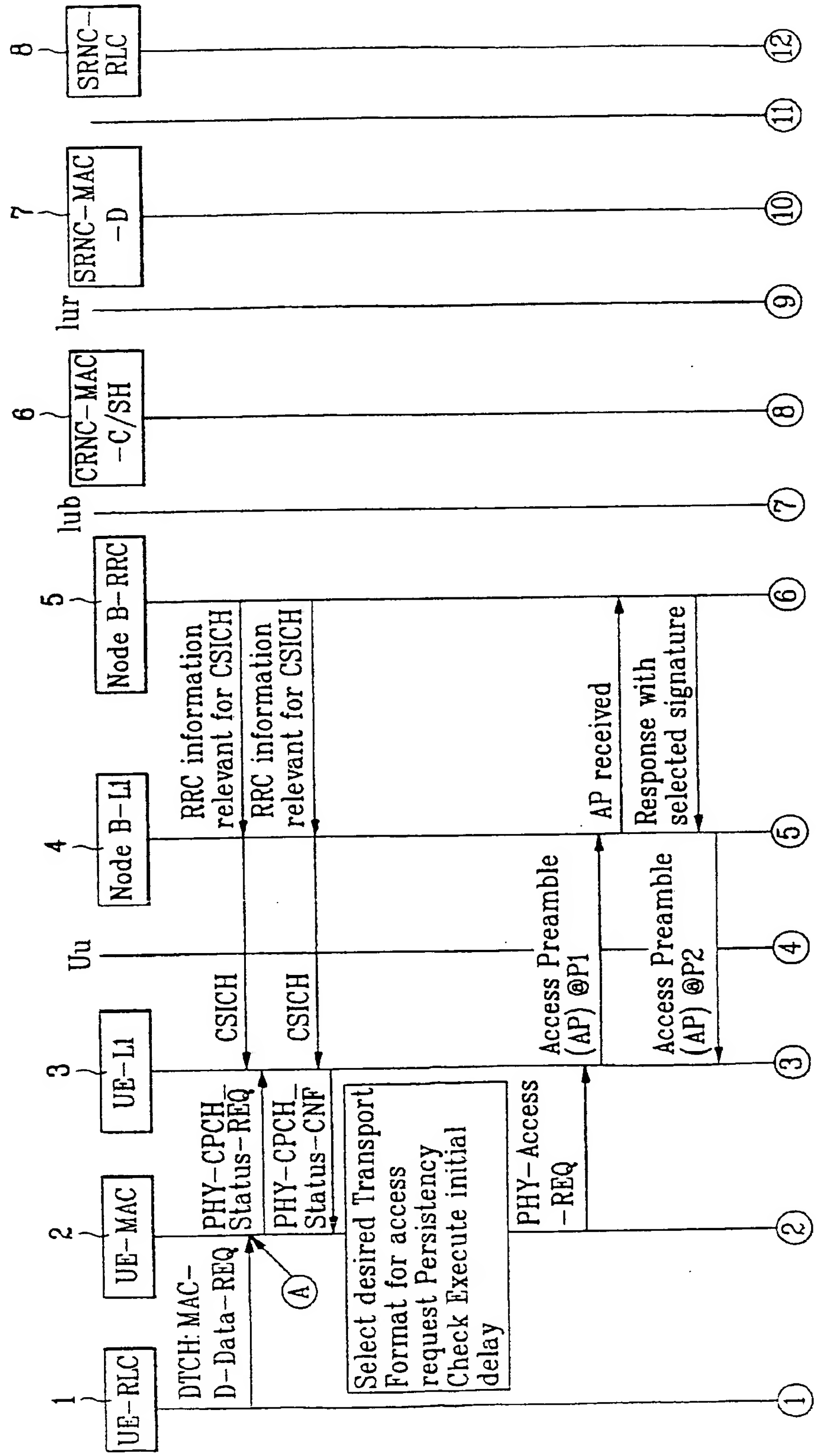
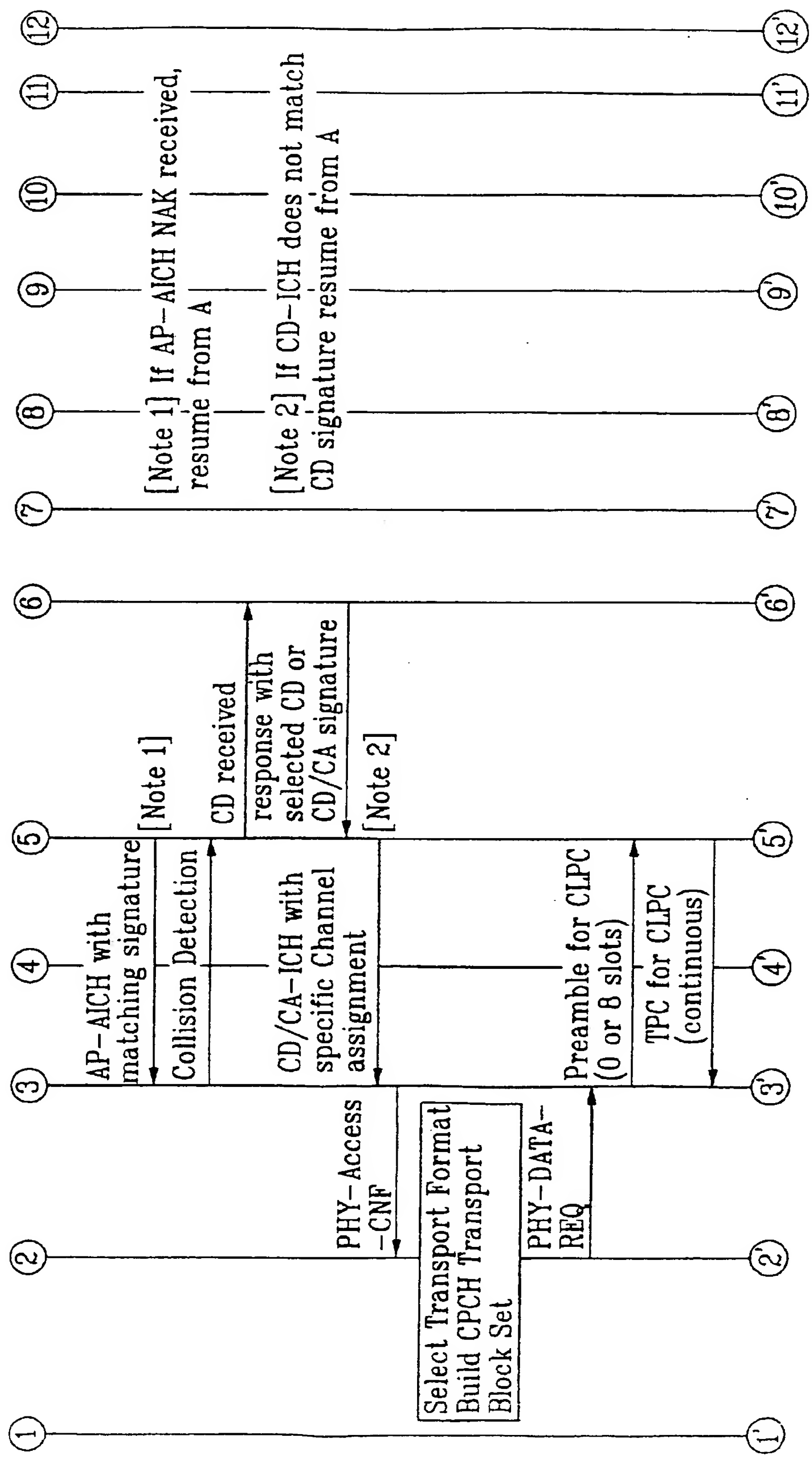
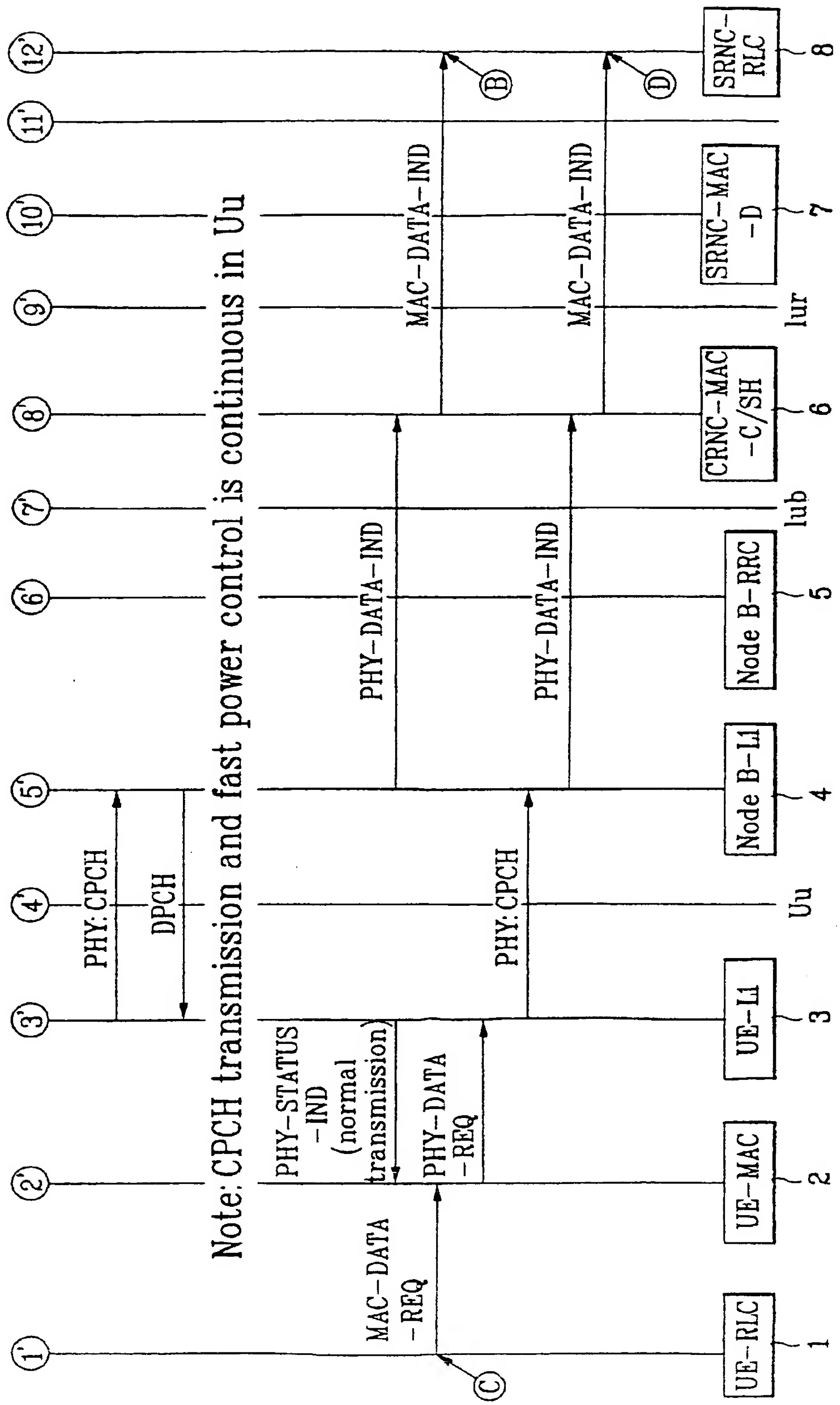

1
UE-RLC
2
UE-MAC
3
UE-L1
Uu
4
Node B-L1
5
Node B-RRC
Iub
6
CRNC-MAC -C/SH
Iur
7
SRNC-MAC -D
8
SRNC-RLC
DTCH: MAC-D-Data-REQ
A
PHY-CPCH_Status-REQ
PHY-CPCH_Status-CNF
CSICH
CSICH
RRC information relevant for CSICH
RRC information relevant for CSICH
Select desired Transport Format for access request Persistency Check Execute initial delay
PHY-Access -REQ
Access Preamble (AP) @P1
Access Preamble (AP) @P2
AP received
Response with selected signature
1
2
3
4
5
6
7
8
9
10
11
12

FIG.3



1
2
3
4
5
6
7
8
9
10
11
12
1'
2'
3'
4'
5'
6'
7'
8'
9'
10'
11'
12'
Select Transport Format
Build CPCH Transport
Block Set
PHY-Access
-CNF
PHY-DATA-
REQ
AP-AICH with
matching signature
Collision Detection
CD/CA-ICH with
specific Channel
assignment
Preamble for CLPC
(0 or 8 slots)
TPC for CLPC
(continuous)
[Note 1]
CD received
response with
selected CD or
CD/CA signature
[Note 2]
[Note 1] If AP-AICH NAK received,
resume from A
[Note 2] If CD-ICH does not match
CD signature resume from A

FIG.3



Note: CPCH transmission and fast power control is continuous in Uu
1'
2'
3'
4'
5'
6'
7'
8'
9'
10'
11'
12'
MAC-DATA
-REQ
PHY-STATUS
-IND
(normal
transmission)
PHY-DATA
-REQ
PHY: CPCH
DPCH
PHY: CPCH
PHY-DATA-IND
PHY-DATA-IND
MAC-DATA-IND
MAC-DATA-IND
C
B
D
UE-RLC
UE-MAC
UE-L1
Uu
Node B-L1
Node B-RRC
Iub
CRNC-MAC
-C/SH
Iur
SRNC-MAC
-D
SRNC-
RLC
1
2
3
4
5
6
7
8

FIG. 4

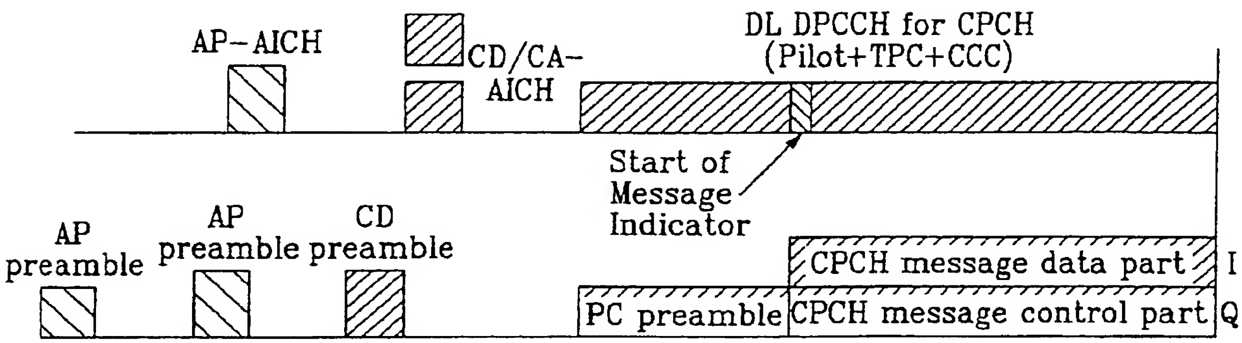

AP-AICH
CD/CA-AICH
DL DPCCH for CPCH
(Pilot+TPC+CCC)
Start of Message Indicator
AP preamble
AP preamble
CD preamble
CPCH message data part
I
PC preamble
CPCH message control part
Q

FIG. 5

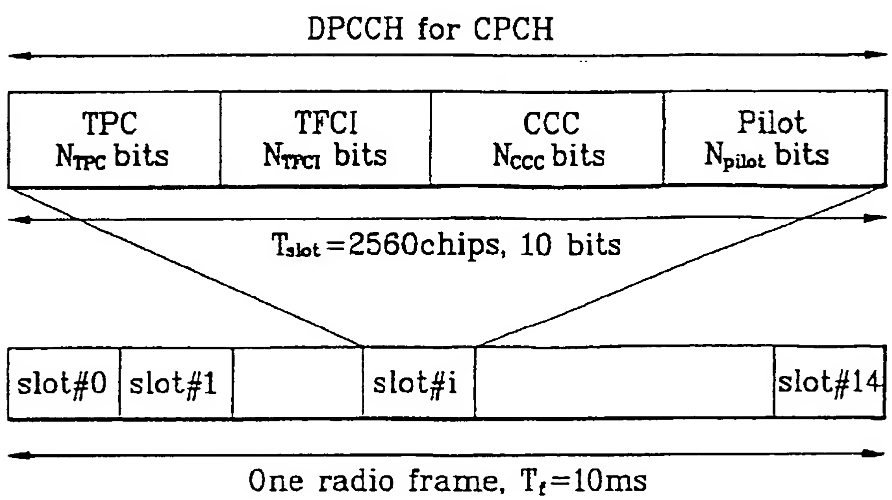

DPCCH for CPCH
TPC
N_{TPC} bits
TFCI
N_{TFCI} bits
CCC
N_{CCC} bits
Pilot
N_{pilot} bits
T_{slot}=2560chips, 10 bits
slot#0
slot#1
slot#i
slot#14
One radio frame, T_f=10ms

FIG.6

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits Slot	DPCCH Bits/Slot				Transmitted slots per radio frame N_{Tr}
					N_{TPC}	N_{TFCI}	N_{CCC}	N_{pilot}	
0	15	7.5	512	10	2	0	4	4	15

FIG.7

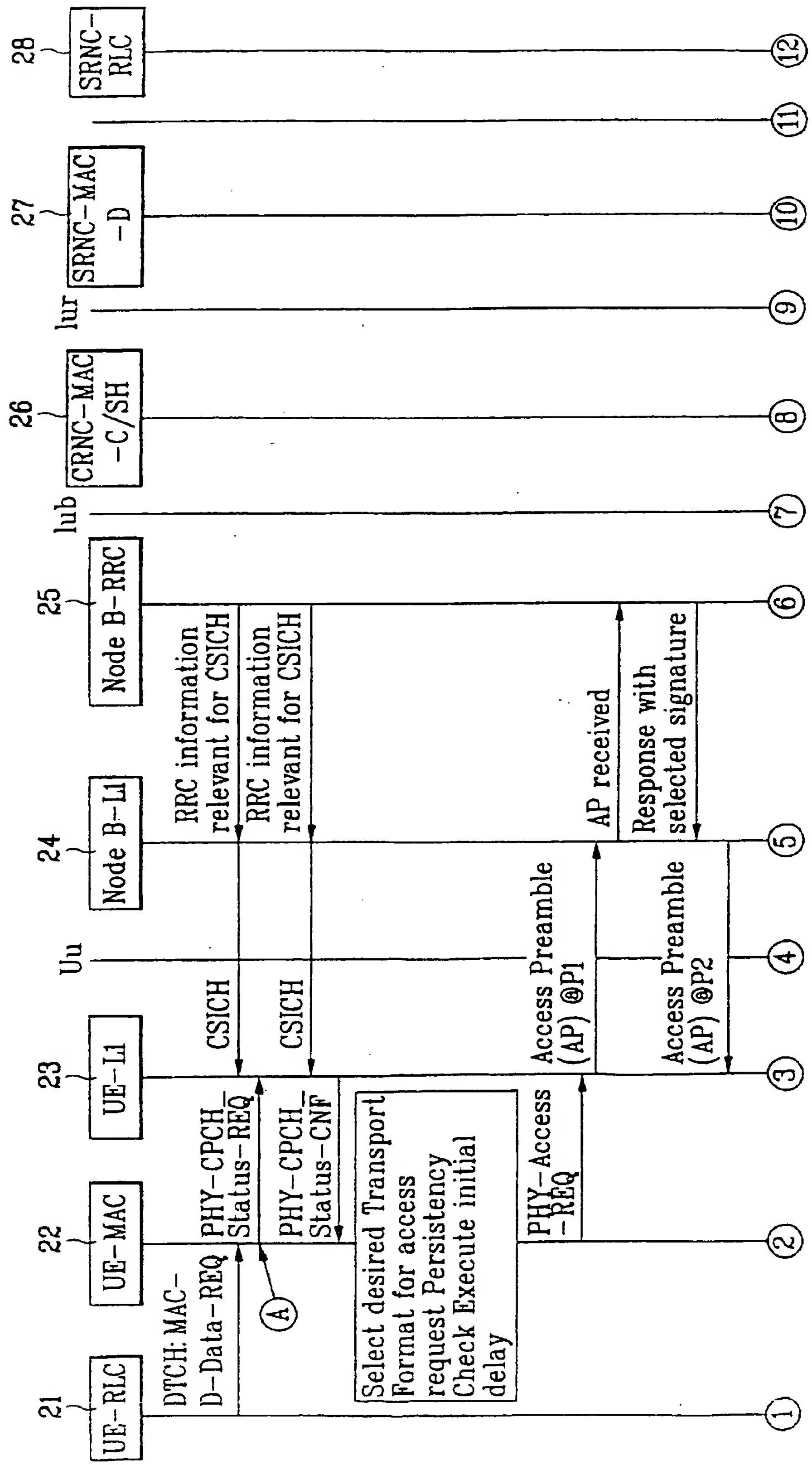

21
UE-RLC
22
UE-MAC
23
UE-L1
Uu
24
Node B-L1
25
Node B-RRC
Iub
26
CRNC-MAC-C/SH
Iur
27
SRNC-MAC-D
28
SRNC-RLC
DTCH: MAC-D-Data-REQ
A
PHY-CPCH_Status-REQ
PHY-CPCH_Status-CNF
Select desired Transport Format for access request Persistency Check Execute initial delay
PHY-Access-REQ
CSICH
CSICH
RRC information relevant for CSICH
RRC information relevant for CSICH
Access Preamble (AP) @P1
AP received
Response with selected signature
Access Preamble (AP) @P2
1
2
3
4
5
6
7
8
9
10
11
12

FIG.7

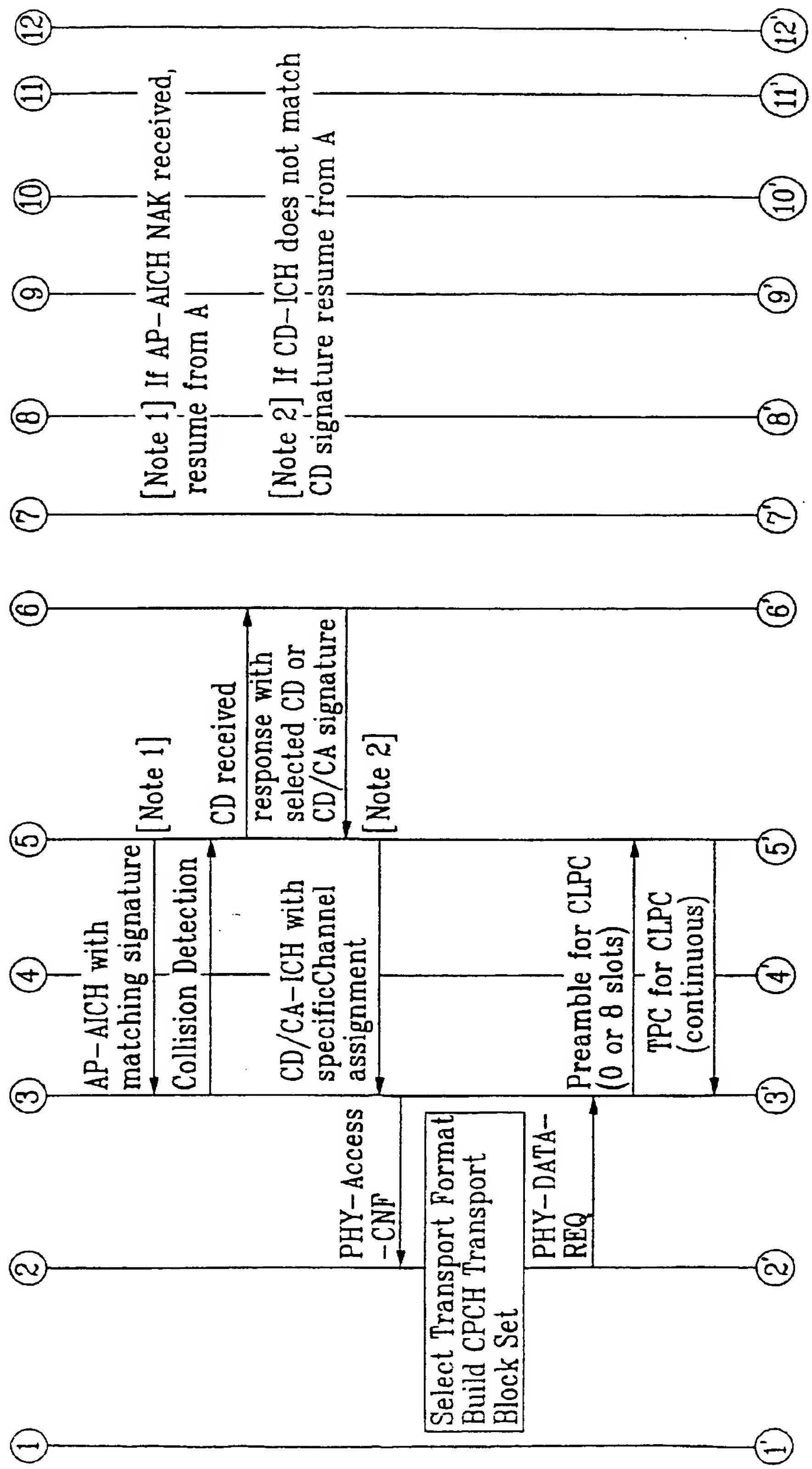

1
2
3
4
5
6
7
8
9
10
11
12
1'
2'
3'
4'
5'
6'
7'
8'
9'
10'
11'
12'
AP-AICH with matching signature
[Note 1]
Collision Detection
CD received
CD/CA-ICH with specificChannel assignment
response with selected CD or CD/CA signature
[Note 2]
PHY-Access -CNF
Select Transport Format
Build CPCH Transport Block Set
PHY-DATA-REQ
Preamble for CLPC (0 or 8 slots)
TPC for CLPC (continuous)
[Note 1] If AP-AICH NAK received, resume from A
[Note 2] If CD-ICH does not match CD signature resume from A

FIG.7

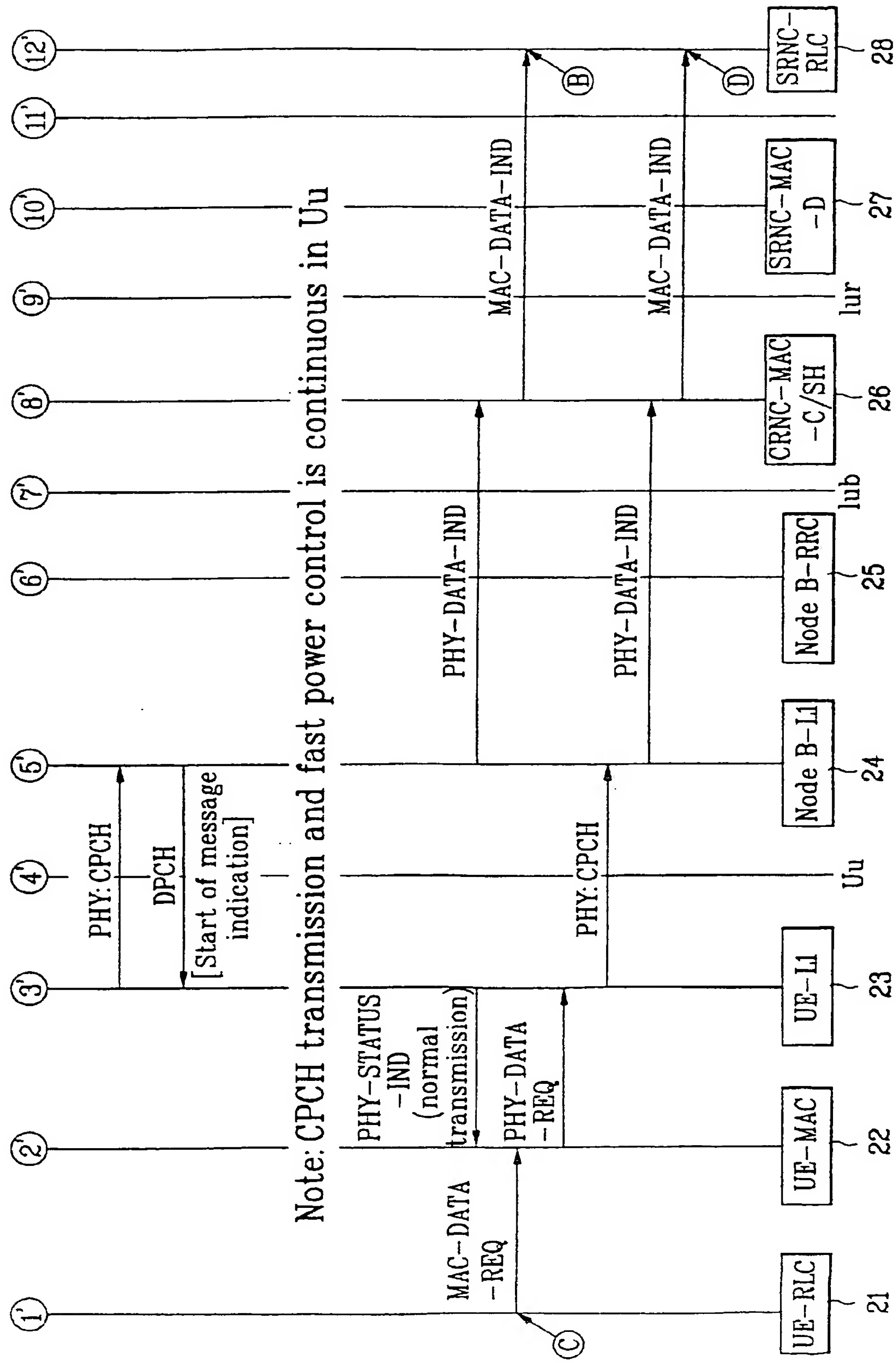

Note: CPCH transmission and fast power control is continuous in Uu
PHY:CPCH
DPCH
[Start of message indication]
MAC-DATA-REQ
PHY-STATUS-IND (normal transmission)
PHY-DATA-REQ
PHY:CPCH
PHY-DATA-IND
PHY-DATA-IND
MAC-DATA-IND
MAC-DATA-IND
UE-RLC
UE-MAC
UE-L1
Node B-L1
Node B-RRC
CRNC-MAC-C/SH
SRNC-MAC-D
SRNC-RLC
Uu
Iub
Iur
21
22
23
24
25
26
27
28

FIG.8

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/Slot	DPCCH Bits/Slot				Transmitted slotsper radio frame N_{Tr}
					N_{TPC}	N_{TFCI}	N_{CCC}	N_{pilot}	
0	15	7.5	512	10	2	2	2	4	15

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